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THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE FOREGOING PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'PHICN'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this eighth day of May, in the year of our Lord two thousand one.

Attest:

Alan H. Post

Acting Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Gustavo Garcia

Gustavo Garcia
App. No. 10/769,207

REF
A4



REPRODUCE LOCALLY. Include form number and date on all reproductions.

FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2428).

| | | | | | |
|--|--|---|--|---|--|
| 1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) | | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER | | 3. VARIETY NAME | |
| Pioneer Hi-Bred International, Inc. | | | | PH1CN | |
| 4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) | | 5. TELEPHONE (include area code) | | FOR OFFICIAL USE ONLY PVPO NUMBER 9800378 | |
| Research and Product Development P.O. Box 85 Johnston, IA 50131-0085 | | 515/270-4051 | | | |
| | | 6. FAX (include area code) | | 7. FILING AND EXAMINATION FEE: | |
| | | 515/253-2125 | | DATE 09/21/1998 | |
| 7. GENUS AND SPECIES NAME | | 8. FAMILY NAME (Botanical) | | FILING AND EXAMINATION FEE: | |
| Zea Mays | | Gramineae <i>JRM 11/3/00</i> | | \$ 2450.00 | |
| 9. CROP KIND NAME (Common name) | | | | DATE 09/21/1998 | |
| Corn | | | | CERTIFICATION FEE: | |
| 10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) (Common name) | | | | \$ 320.00 | |
| Corporation | | | | DATE 3/20/01 | |
| 11. IF INCORPORATED, GIVE STATE OF INCORPORATION | | 12. DATE OF INCORPORATION | | | |
| Iowa | | May 6, 1926 | | | |
| 13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS | | | | 14. TELEPHONE (including area code) | |
| Steven R. Anderson Research and Product Development P.O. Box 85 Johnston, IA 50131-0085 | | | | 515/270-4051 | |
| | | | | 15. FAX (include area code) | |
| | | | | 515/253-2125 | |
| 16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) | | | | | |
| <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness <input checked="" type="checkbox"/> Exhibit C. Objective Description of the Variety <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Applicant's Ownership <input checked="" type="checkbox"/> Voucher Sample (2,600 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in an approved public repository) <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,450), made payable to "Treasury of the United States" (Mail to PVPO) | | | | | |
| 17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) | | | | | |
| <input type="checkbox"/> YES (If "yes," answer items 18 and 19 below) <input checked="" type="checkbox"/> NO (If "no," go to item 20) | | | | | |
| 18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? | | | 19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? | | |
| <input type="checkbox"/> YES <input type="checkbox"/> NO | | | <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED | | |
| 20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES? | | | | | |
| <input checked="" type="checkbox"/> YES (If "yes," give names of countries and dates) United States, Canada; Nov. 1, 1997 <input type="checkbox"/> NO | | | | | |
| 21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. | | | | | |
| The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. | | | | | |
| Applicant(s) is(are) informed that false representation herein can jeopardize protection and results in penalties. | | | | | |
| SIGNATURE OF APPLICANT (Owner(s)) | | | SIGNATURE OF APPLICANT (Owner(s)) | | |
| | | | <i>Steven R. Anderson</i> | | |
| NAME (Please print or type) | | | NAME (Please print or type) | | |
| | | | Steven R. Anderson | | |
| CAPACITY OR TITLE | | DATE | | CAPACITY OR TITLE | |
| | | | | Senior Research Associate | |
| | | | | DATE | |
| | | | | 9-16-98 | |

STD-470 (03-88) (Previous editions are to be destroyed)

(See reverse for instructions and information collection burden statement)

Exhibit A. Origin and Breeding History

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Pedigree: PHK76/PHJ89)XC313244K1X

Pioneer Line PH1CN, Zea mays L., a dent corn inbred, was developed by Pioneer Hi-Bred International, Inc. from the single cross PHK76 (Certificate No. 8800036) X PHJ89 (Certificate No. 9100092) using the pedigree method of breeding. The progenitors of PH1CN are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Selfing and selection were practiced within the above F1 cross for 7 generations in the development of PH1CN at Mankato, Minnesota. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Mankato, Minnesota, as well as other Pioneer research locations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations made for uniformity.

PH1CN has shown uniformity and stability for all traits as described in Exhibit C - "Objective Description of Variety". It has been self-pollinated and ear-rowed 7 generations with careful attention paid to uniformity of plant type to assure genetic homozygosity and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity.*

No variant traits have been observed or are expected in PH1CN.

The criteria used in the selection of PH1CN were yield, both per se and in hybrid combinations; kernel size, especially important in production; ability to germinate in adverse conditions, hard kernel texture, number of tillers, especially important in production because having numerous tillers increases hybrid production costs spent on detasseling; disease and insect resistance; pollen yield and tassel size.

* The line PH1CN has been increased both by hand and in isolated fields with continued observations for uniformity and stability throughout development, and for 3 generations during the final stages of inbred development and seed multiplication.

10/1/78

Exhibit A

9800378

DEVELOPMENTAL HISTORY FOR PH1CN

| <u>Season/Year</u> | <u>Inbreeding Level</u> |
|--------------------|-------------------------|
| Summer 1988 | F0 |
| Winter 1988 | F1 |
| Summer 1989 | F2#* |
| Summer 1990 | F3#* |
| Summer 1991 | F4#* |
| Summer 1992 | F5#* |
| Summer 1993 | F6#* |
| Summer 1994 | F7#* |
| Winter 1994 | F8#* |
| Summer 1995 | F9 |
| Winter 1995 | F10 |
| | Bulk Increase |

#PH1CN was selfed and selected through F8 generation.

*PH1CN was selfed and ear-rowed from F2 through F8 generation.

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Exhibit B. Novelty Statement

PH1CN mostly resembles Pioneer Hi-Bred International, Inc. proprietary inbred line PHJ89 (PVP Certificate No. 100092). The data in Table 1A and 1B are from paired comparisons collected primarily from two environments in Johnston, IA. The data in Table 2 are from paired comparisons at multiple locations grown primarily in the adapted growing area of PH1CN. The traits in Table 1A, 1B, and Table 2 collectively show measurable differences between the two varieties.

Variety PH1CN has wider cob diameter (22.5 mm vs 17.7 mm) than variety PHJ89 (Table 1A, 1B).

Variety PH1CN has wider ear diameter (40.9 mm vs 36.6 mm) than variety PHJ89 (Table 1A, 1B).

Variety PH1CN has longer husk extension length (3.7 cm vs 1.0 cm) than variety PHJ89 (Table 1A, 1B).

Variety PH1CN has longer husk length (19.5 cm vs 17.3 cm) than variety PHJ89 (Table 1A, 1B).

Variety PH1CN has a lower tassel axis floret density (15.4 florets/4cm vs 20.0 florets/4cm) than variety PHJ89 (Table 1A, 1B).

Variety PH1CN has a shorter tassel central spike length (21.8 cm vs 28.9 cm) than variety PHJ89 (Table 1A, 1B).

Variety PH1CN has higher grain yield (GQU/HA) (37.8 quintals/ha vs 21.8 quintals/ha) than variety PHJ89 (Table 1).

Variety PH1CN reaches 50% pollen shed (GDUSHD) sooner (1268 GDU's vs 1307 GDU's) than variety PHJ89 (Table 1).

Variety PH1CN reaches 50% silking (GDUSLK) sooner (1291 GDU's vs 1320 GDU's) than variety PHJ89 (Table 1).

Exhibit B Novelty Statement Tables

Table 1A Data from Johnston, IA at 2 different locations in 1997 are supporting evidence for differences between PH1CN and PHJ89. Locations had different environmental conditions. One environment was irrigated and 1 was not. Environments had different planting dates and were in different fields.

| station | loc | year | Trait | variety-1 | variety-2 | Count -1 | Count -2 | Mean 1 | Mean 2 | Mean Diff | StdDev ation-1 | StdDev ation-2 | DF Pooled | t-Value Pooled | Prob (2- tail) Pooled |
|---------|-----|------|--|-----------|-----------|-------------|-------------|-----------|-----------|--------------|-------------------|-------------------|--------------|-------------------|-----------------------------|
| AD | 20N | 1997 | cob diameter (mm) | PH1CN | PHJ89 | 5 | 5 | 22.4 | 17.8 | 4.6 | 0.894 | 1.304 | 8 | 6.51 | 0.000 |
| JH | 21 | 1997 | cob diameter (mm) | PH1CN | PHJ89 | 5 | 5 | 22.6 | 17.6 | 5.0 | 1.140 | 1.140 | 8 | 6.93 | 0.000 |
| AD | 20N | 1997 | ear diameter (mm) | PH1CN | PHJ89 | 5 | 5 | 41.6 | 36.8 | 4.8 | 1.140 | 1.924 | 8 | 4.80 | 0.001 |
| JH | 21 | 1997 | ear diameter (mm) | PH1CN | PHJ89 | 5 | 5 | 40.2 | 36.4 | 3.8 | 0.447 | 1.817 | 8 | 4.54 | 0.002 |
| AD | 20N | 1997 | husk extension length (cm) | PH1CN | PHJ89 | 5 | 5 | 3.6 | 1.0 | 2.6 | 1.140 | 1.000 | 8 | 3.83 | 0.005 |
| JH | 21 | 1997 | husk extension length (cm) | PH1CN | PHJ89 | 5 | 5 | 3.8 | 1.0 | 2.8 | 1.924 | 1.414 | 8 | 2.62 | 0.031 |
| AD | 20N | 1997 | husk length (cm) | PH1CN | PHJ89 | 5 | 5 | 19.6 | 17.4 | 2.2 | 1.140 | 1.517 | 8 | 2.59 | 0.032 |
| JH | 21 | 1997 | husk length (cm) | PH1CN | PHJ89 | 5 | 5 | 19.4 | 17.2 | 2.2 | 0.894 | 0.447 | 8 | 4.92 | 0.001 |
| AD | 20N | 1997 | tassel axis floret density (# of florets/4cm) | PH1CN | PHJ89 | 5 | 5 | 12.6 | 16.8 | -4.2 | 2.074 | 2.775 | 8 | -2.71 | 0.027 |
| JH | 21 | 1997 | tassel axis floret density (# of florets/4cm) | PH1CN | PHJ89 | 5 | 5 | 18.2 | 23.2 | -5.0 | 3.114 | 2.049 | 8 | -3.00 | 0.017 |
| AD | 20N | 1997 | tassel central spike length (cm) | PH1CN | PHJ89 | 5 | 5 | 20.6 | 29.2 | -8.6 | 3.362 | 1.095 | 8 | -5.44 | 0.001 |
| JH | 21 | 1997 | tassel central spike length (cm) | PH1CN | PHJ89 | 5 | 5 | 23.0 | 28.6 | -5.6 | 1.225 | 1.673 | 8 | -6.04 | 0.000 |

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Table 1B. Summary data from Johnston, IA across 2 different locations in 1997 are supporting evidence for differences between PH1CN and PHJ89. Locations had different environmental conditions. One environment was irrigated and 1 was not. Environments had different planting dates and were in different fields.

| year | Trait | Variety-1 | Variety-2 | Count-1 | Count-2 | Mean-1 | Mean-2 | Mean Diff | StdDeviation-1 | StdDeviation-2 | DF | t-Value Pooled | Prob (2-tail) Pooled |
|------|---|-----------|-----------|---------|---------|--------|--------|-----------|----------------|----------------|----|----------------|----------------------|
| 1997 | cob diameter (mm) | PH1CN | PHJ89 | 10 | 10 | 22.5 | 17.7 | 4.8 | 0.972 | 1.160 | 18 | 10.03 | 0.000 |
| 1997 | ear diameter (mm) | PH1CN | PHJ89 | 10 | 10 | 40.9 | 36.6 | 4.3 | 1.101 | 1.776 | 18 | 6.51 | 0.000 |
| 1997 | husk extension length (cm) | PH1CN | PHJ89 | 10 | 10 | 3.7 | 1.0 | 2.7 | 1.494 | 1.155 | 18 | 4.52 | 0.000 |
| 1997 | husk length (cm) | PH1CN | PHJ89 | 10 | 10 | 19.5 | 17.3 | 2.2 | 0.972 | 1.059 | 18 | 4.84 | 0.000 |
| 1997 | tassel axis floret density (# of florets/4cm) | PH1CN | PHJ89 | 10 | 10 | 15.4 | 20.0 | -4.6 | 3.864 | 4.082 | 18 | -2.59 | 0.019 |
| 1997 | tassel central spike length (cm) | PH1CN | PHJ89 | 10 | 10 | 21.8 | 28.9 | -7.1 | 2.700 | 1.370 | 18 | -7.42 | 0.000 |

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Exhibit B Novelty Statement Tables

Table 2. These data indicate differences between varieties PH1CN and PHJ89. Data are from multiple locations and years grown primarily in the adapted growing area.

Variety 1 = PH1CN

Variety 2 = PHJ89

| | | GQU | GDU | GDU |
|-----------|------|-------|-------|-------|
| | VAR | /HA | SHD | SLK |
| YEAR | # | ABS | ABS | ABS |
| 95 | 1 | | 1263 | 1276 |
| | 2 | | 1318 | 1323 |
| | LOCS | | 16 | 16 |
| | REPS | | 16 | 16 |
| | DIFF | | -55 | -47 |
| | PROB | | .000# | .002# |
| 96 | 1 | 27.8 | 1272 | 1305 |
| | 2 | 17.3 | 1298 | 1314 |
| | LOCS | 4 | 34 | 33 |
| | REPS | 4 | 34 | 33 |
| | DIFF | 10.5 | -26 | -9 |
| | PROB | .013+ | .001# | 0.152 |
| 97 | 1 | 47.9 | 1265 | 1283 |
| | 2 | 26.4 | 1313 | 1328 |
| | LOCS | 4 | 24 | 24 |
| | REPS | 4 | 24 | 24 |
| | DIFF | 21.5 | -48 | -45 |
| | PROB | .005# | .000# | .000# |
| TOTAL SUM | 1 | 37.8 | 1268 | 1291 |
| | 2 | 21.8 | 1307 | 1320 |
| | LOCS | 8 | 74 | 73 |
| | REPS | 8 | 74 | 73 |
| | DIFF | 16 | -39 | -29 |
| T-TEST | PROB | .001# | .000# | .000# |

5900579

Exhibit C
(Corn Maize)

United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

Objective Description of Variety
Corn (*Zea mays* L.)

| | | | | |
|---|-------------------------|--------------------------|--|--------------------------|
| Name of Applicant (s) Pioneer Hi-Bred International, Inc. | | Variety Seed Source | Variety Name or Temporary Designation PH1CN | |
| Address (Street & No., or RFD No., City, State, Zip Code and Country) 301 NW 62nd Avenue, P.O. Box 85, Johnston, Iowa 50131-0085 | | | FOR OFFICIAL USE | |
| | | | PVP0 Number | |
| Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by an '*' are considered necessary for an adequate variety description and must be completed. | | | | |
| COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices: describe #25 and #26 in Comments section): | | | | |
| 1=Light Green | 06=Pale Yellow | 11=Pink | 16=Pale Purple | 21=Buff |
| 2=Medium Green | 07=Yellow | 12=Light Red | 17=Purple | 22=Tan |
| 3=Dark Green | 08=Yellow Orange | 13=Cherry Red | 18=Colorless | 23=Brown |
| 4=Very Dark Green | 09=Salmon | 14=Red | 19=White | 24=Bronze |
| 5=Green-Yellow | 10=Pink-Orange | 15=Red & White | 20=White Capped | 25=Variegated (Describe) |
| | | | | 26=Other (Describe) |
| STANDARD INBRED CHOICES | | | | |
| Use the most similar (in background and maturity) of these to make comparisons based on grow-out trial data): | | | | |
| Yellow Dent Families: | | Yellow Dent (Unrelated): | Sweet Corn: | |
| Family | Members | | C13, Iowa5125, P39, 2132 | |
| 14 | CM105, A632, B64, B68 | Oh7, T232, | | |
| 37 | B37, B76, H84 | W117, W153R, | Popcorn: | |
| 73 | N192, A679, B73, NC268 | W18BN | SG1533, 4722, HP301, HP7211 | |
| 103 | Mo17, Va102, Va35, A682 | | | |
| 143 | A619, MS71, H99, Va26 | White Dent: | Pipcorn: | |
| 179 | W64A, A554, A654, Pa91 | C166, H105, Ky228 | Mo15W, Mo16W, Mo24W | |

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EXHIBIT C: PH1CN

| | | | | | |
|--|--|--|---|--|--|
| 1. TYPE: (describe intermediate types in Comments section): 2 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental | | | Standard Variety Name A619 | | |
| 2. REGION WHERE DEVELOPED IN THE U.S.A.: 2 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other | | | Standard Seed Source AMES 19306 | | |
| 3. MATURITY (In Region of Best Adaptability; show Heat Unit formula in 'Comments' section) DAYS HEAT UNITS 070 1,242.5 From emergence to 50% of plants in silk 070 1,224.0 From emergence to 50% of plants in pollen 005 0,107.8 From 10% to 90% pollen shed 066 1,259.8 From 50% silk to optimum edible quality 066 1,240.3 From 50% silk to harvest at 25% moisture | | | DAYS HEAT UNITS 072 1,277.0 071 1,256.3 005 0,112.5 066 1,240.3 | | |
| 4. PLANT: Standard Deviation Sample Size 217.0 cm Plant Height (to tassel tip) 10.39 04 074.8 cm Ear Height (to base of top ear node) 13.10 04 013.6 cm Length of Top Ear Internode 01.05 04 0.0 Average Number of Tillers 00.00 04 1.3 Average Number of Ears per Stalk 00.50 04 3 Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark | | | Standard Deviation Sample Size 183.8 24.96 04 057.8 14.84 04 014.9 02.04 04 0.0 00.00 04 1.0 00.00 04 2 | | |
| 5. LEAF: Standard Deviation Sample Size 08.7 cm Width of Ear Node Leaf 00.76 04 66.8 cm Length of Ear Node Leaf 03.45 04 06 Number of leaves above top ear 00.41 04 40 Degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf) 13.66 04 03 Leaf Color (Munsell code) 5GY34 1 Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz) 5 Marginal Waves (Rate on scale from 1=none to 9=many) 7 Longitudinal Creases (Rate on scale from 1=none to 9=many) | | | Standard Deviation Sample Size 09.1 00.99 04 65.9 06.45 04 06 00.44 04 42 04.19 04 03 5GY34 1 8 7 | | |
| 6. TASSEL: Standard Deviation Sample Size 05 Number of Primary Lateral Branches 00.20 03 31 Branch Angle from Central Spike 12.49 03 54.1 cm Tassel Length (from top leaf collar to tassel tip) 03.06 03 6 Pollen Shed (rate on scale from 0=male sterile to 9=heavy shed) 01 Anther Color (Munsell code) 2.5GY86 01 Glume Color (Munsell code) 5GY76 1 Bar Glumes (Glume Bands): 1=Absent 2=Present | | | Standard Deviation Sample Size 08 00.85 04 31 13.96 04 56.4 02.09 04 7 05 10Y810 01 5GY66 1 | | |
| Application Variety Data | | | Standard Variety Data | | |

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Application Variety Data

PH1CN

Page 2

Standard Variety Data

7a. EAR (Unhusked Data):

- 01 Silk Color (3 days after emergence) (Munsell code) 2.5GY94
 02 Fresh Husk Color (25 days after 50% silking) (Munsell code) 5GY46
 21 Dry Husk Color (65 days after 50% silking) (Munsell code) 2.5Y92
 1 Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendant
 8 Husk Tightness (Rate of Scale from 1=very loose to 9=very tight)
 2 Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8 cm)
 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)

- 07 2.5GY94
 01 5GY76
 21 2.5Y8.54
 3
 7
 2

7b. EAR (Husked Ear Data):

| | Standard Deviation | Sample Size | Standard Deviation | Sample Size |
|--|-----------------------|----------------|-----------------------|----------------|
| 14.0 cm Ear Length | 00.82 | 04 | 14.0 | 02.31 04 |
| 41.5 mm Ear Diameter at mid-point | 01.91 | 04 | 46.0 | 01.41 04 |
| 119.3 gm Ear Weight | 18.21 | 04 | 97.8 | 26.59 04 |
| 14 Number of Kernel Rows | 01.15 | 04 | 15.0 | 00.82 04 |
| 2 Kernel Rows: 1=Indistinct 2=Distinct | | | 2 | |
| 2 Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral | | | 1 | |
| 12.5 cm Shank Length | 01.00 | 04 | 11.5 | 01.91 04 |
| 2 Ear Taper: 1=Slight 2=Average 3=Extreme | | | 2 | |

8. KERNEL (Dried)

| | Standard Deviation | Sample Size | Standard Deviation | Sample Size |
|--|-----------------------|----------------|-----------------------|----------------|
| 10.8 mm Kernel Length | 00.50 | 04 | 10.8 | 00.50 04 |
| 07.8 mm Kernel Width | 00.50 | 04 | 08.5 | 00.58 04 |
| 04.5 mm Kernel Thickness | 00.58 | 04 | 04.5 | 00.58 04 |
| 20.8 % Round Kernels (Shape Grade) | 04.99 | 04 | 21.8 | 06.95 04 |
| 1 Aleurone Color Pattern: 1=Homozygous 2=Segregating | | | 1 | |
| 07 Aleurone Color (Munsell code) | 2.5Y812 | | 07 | 10YR814 |
| 07 Hard Endosperm Color (Munsell code) | 10YR712 | | 07 | 10YR712 |
| 03 Endosperm Type: | | | 3 | |
| 1=Sweet (Su1) 2=Extra Sweet (sh2) 3=Normal Starch | | | | |
| 4=High Amylose Starch 5=Waxy Starch 6=High Protein | | | | |
| 7=High Lysine 8=Super Sweet (se) 9=High Oil | | | | |
| 10=Other | | | | |
| 28.3 gm Weight per 100 Kernels (unsized sample) | 01.26 | 04 | 27.00 | 01.63 04 |

9. COB:

| | Standard Deviation | Sample Size | Standard Deviation | Sample Size |
|---|-----------------------|----------------|-----------------------|----------------|
| 22.5 mm Cob Diameter at mid-point | 01.29 | 04 | 28.0 | 01.15 04 |
| 19 Cob Color (Munsell code) <u>5Y91</u> | | | 19 | 2.5Y92 |

Application Variety Data

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Application Variety Data

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10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant);
leave blank if not tested; leave Race or Strain Options blank if polygenic):

A. Leaf Blights, Wilts, and Local Infection Diseases

Anthracnose Leaf Blight (*Colletotrichum graminicola*)
Common Rust (*Puccinia sorghi*)
Common Smut (*Ustilago maydis*)
6 Eyespot (*Kabatiella zeae*)
8 Goss's Wilt (*Clavibacter michiganense* spp. *nebraskense*)
2 Gray Leaf Spot (*Cercospora zeae-maydis*)
Helminthosporium Leaf Spot (*Bipolaris zeicola*) Race _____
7 Northern Leaf Blight (*Exserohilum turcicum*) Race _____
Southern Leaf Blight (*Bipolaris maydis*) Race _____
Southern Rust (*Puccinia polysora*)
Stewart's Wilt (*Erwinia stewartii*)
Other (Specify) _____

4

5

2

4

B. Systemic Diseases

Corn Lethal Necrosis (MCMV and MDMV)
7 Head Smut (*Sphacelotheca reiliana*)
Maize Chlorotic Dwarf Virus (MDV)
Maize Chlorotic Mottle Virus (MCMV)
Maize Dwarf Mosaic Virus (MDMV)
Sorghum Downy Mildew of Corn (*Peronosclerospora sorghi*)
Other (Specify) _____

8

C. Stalk Rots

Anthracnose Stalk Rot (*Colletotrichum graminicola*)
Diplodia Stalk Rot (*Stenocarpella maydis*)
Fusarium Stalk Rot (*Fusarium moniliforme*)
Gibberella Stalk Rot (*Gibberella zeae*)
Other (Specify) _____

D. Ear and Kernel Rots

Aspergillus Ear and Kernel Rot (*Aspergillus flavus*)
Diplodia Ear Rot (*Stenocarpella maydis*)
2 Fusarium Ear and Kernel Rot (*Fusarium moniliforme*)
8 Gibberella Ear Rot (*Gibberella zeae*)
Other (Specify) _____

4

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Application Variety Data
Data

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Standard Variety

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11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); (leave blank if not tested) :

| | |
|---|---|
| <p>Banks grass Mite (<i>Oligonychus pratensis</i>) Corn Worm (<i>Helioverpa zea</i>) Leaf Feeding Silk Feeding mg larval wt. Ear Damage Corn Leaf Aphid (<i>Rhopalosiphum maidis</i>) Corn Sap Beetle (<i>Carpophilus dimidiatus</i>) European Corn Borer (<i>Ostrinia nubilalis</i>) 1st Generation (Typically Whorl Leaf Feeding) 2nd Generation (Typically Leaf Sheath-Collar Feeding) Stalk Tunneling cm tunneled/plant Fall Armyworm (<i>Spodoptera frugiperda</i>) Leaf Feeding Silk Feeding mg larval wt. Maize Weevil (<i>Sitophilus zeamais</i>) Northern Rootworm (<i>Diabrotica barberi</i>) Southern Rootworm (<i>Diabrotica undecimpunctata</i>) Southwestern Corn Borer (<i>Diatraea grandiosella</i>) Leaf Feeding Stalk Tunneling cm tunneled/plant Two-spotted Spider Mite (<i>Tetranychus urticae</i>) Western Rootworm (<i>Diabrotica virgifera virgifera</i>) Other (Specify) _____</p> | <p>I</p> |
| <p>12. AGRONOMIC TRAITS:</p> <p>4 Staygreen (at 65 days after anthesis) (Rate on a scale from 1=worst to excellent)</p> <p>0.0 % Dropped Ears (at 65 days after anthesis) % Pre-anthesis Brittle Snapping % Pre-anthesis Root Lodging</p> <p>0.0 Post-anthesis Root Lodging (at 65 days after anthesis)</p> <p>3,783.8 Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)</p> | <p>2</p> <p>0.0</p> <p>1.2</p> <p>2,226.2</p> |

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied):

| | | |
|------------|----------|----------|
| 1 Isozymes | 1 RFLP's | 0 RAPD's |
|------------|----------|----------|

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D):

Application Variety Data
 Data

Page 4

Standard Variety

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CLARIFICATION OF DATA IN EXHIBITS B, C AND D

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Please note the data presented in Exhibit C, "Objective Description of Variety," are collected primarily at Johnston, Iowa. The data in Exhibit B and D are from comparisons of inbreds grown in the same tests in the adapted growing area of PH1CN and in Johnston, IA. The data in table 1A and 1B are from paired comparisons collected in Johnston, IA. The data in table 2 are from paired comparisons grown primarily in the adapted growing area of PH1CN. The traits in exhibit B collectively show distinct differences between the two varieties.

The data collected in exhibit C was collected in 1996 and 1997 for page 1 and 2. There are environmental factors that differ from year to year. In 1996, May was very wet and July/August were cool with very little heat or drought stress compared to most years. There was more total rainfall in 1996 than in 1997. Environmental temperature and precipitation differences during the vegetative and grain fill periods can impact plant and grain traits and be a source of variability. Please see table 3, which summarizes rainfall and growing season temperatures from 1994-1997. The environmental conditions described above could result in larger standard deviations. The variation associated with year to year factors is normally higher than the variation associated within locations or from location to location in a given year.

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Table 3. Average temperatures (Fahrenheit) and rainfall (inches) for central Iowa.

TEMPERATURE

| YEAR | MAY | JUN | JULY | AUG | AVERAGE |
|------|------|------|------|------|---------|
| 1994 | 59.8 | 70.7 | 71.9 | 69.0 | 67.9 |
| 1995 | 56.2 | 69.4 | 74.3 | 76.9 | 69.2 |
| 1996 | 56.2 | 69.3 | 71.3 | 70.5 | 66.8 |
| 1997 | 53.5 | 70.6 | 74.1 | 69.6 | 67.0 |
| AVG | 56.4 | 70.0 | 72.9 | 71.5 | 67.7 |

RAINFALL

| YEAR | MAY | JUN | JULY | AUG | Total |
|------|------|------|------|------|-------|
| 1994 | 3.67 | 5.75 | 1.71 | 4.18 | 15.31 |
| 1995 | 5.04 | 4.19 | 2.94 | 2.87 | 15.04 |
| 1996 | 8.47 | 4.35 | 2.51 | 2.14 | 17.47 |
| 1997 | 4.32 | 3.27 | 4.10 | 1.36 | 13.05 |
| AVG | 5.38 | 4.39 | 2.82 | 2.64 | 15.22 |

Exhibit D. Additional Paired Comparison Data

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| Variety #1= PH1CN | BU | ACR | %MN | GQU | MST | SDG | TIL | GDU | GDU | GDU | POL | POL | POL | TAS | RT |
|-------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Variety #2= PHJ89 | VAR | # | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS |
| 95 | 1 | | | | | 5.3 | 6.9 | 1263 | 1276 | 1276 | | | | 5.6 | 100 |
| | 2 | | | | | 4.4 | 0.7 | 1318 | 1323 | 1323 | | | | 6.2 | 79.6 |
| | LOCS | | | | | 8 | 11 | 16 | 16 | 16 | | | | 5 | 2 |
| | REPS | | | | | 8 | 11 | 16 | 16 | 16 | | | | 5 | 2 |
| | PROB | | | | | .087* | 0.367 | .000# | .002# | .002# | | | | 0.426 | 0.5 |
| 96 | 1 | 107 | 27.8 | 21.9 | 5.5 | 5.5 | 3.3 | 1272 | 1305 | 1305 | 146.1 | 5.7 | 4.8 | | |
| | 2 | 66 | 17.3 | 20.3 | 5.3 | 3.6 | 1298 | 1314 | 1314 | 171.1 | 5.7 | 4.8 | | | |
| | LOCS | 4 | 4 | 4 | 13 | 17 | 34 | 34 | 33 | 33 | 4 | 3 | 18 | | |
| | REPS | 4 | 4 | 4 | 13 | 17 | 34 | 34 | 33 | 33 | 4 | 3 | 18 | | |
| | PROB | .024+ | .013+ | 0.49 | 0.513 | 0.892 | .001# | .001# | 0.152 | 0.608 | 1 | 0.932 | | | |
| 97 | 1 | 138 | 47.9 | 13.5 | 6.7 | 2 | 2 | 1265 | 1283 | 1283 | 230.8 | 5 | 4.6 | | 100 |
| | 2 | 76 | 26.4 | 12.4 | 5.2 | 0.5 | 0.5 | 1313 | 1328 | 1328 | 216.3 | 5 | 4.4 | | 100 |
| | LOCS | 4 | 4 | 4 | 11 | 8 | 24 | 24 | 24 | 24 | 2 | 1 | 14 | | 4 |
| | REPS | 4 | 4 | 4 | 11 | 8 | 24 | 24 | 24 | 24 | 2 | 1 | 14 | | 4 |
| | PROB | .010+ | .005# | 0.102 | .001# | 0.216 | .000# | .000# | .000# | 0.399 | | | 0.336 | | 1 |
| TOTAL SUM | 1 | 123 | 37.8 | 17.7 | 5.9 | 4.1 | 4.1 | 1268 | 1291 | 1291 | 174.3 | 5 | 4.9 | | 100 |
| | 2 | 71 | 21.8 | 16.3 | 5 | 2 | 2 | 1307 | 1320 | 1320 | 186.1 | 5.6 | 4.9 | | 93.2 |
| | LOCS | 8 | 8 | 8 | 32 | 36 | 74 | 74 | 73 | 73 | 6 | 5 | 37 | | 6 |
| | REPS | 8 | 8 | 8 | 32 | 36 | 74 | 74 | 73 | 73 | 6 | 5 | 37 | | 6 |
| | DIFF | 52 | 16 | 1.4 | 0.8 | 2.1 | 39 | 39 | 29 | 11.8 | 0.6 | 0 | 0 | | 6.8 |
| T-TEST | PROB | .000# | .001# | 0.211 | .001# | 0.338 | .000# | .000# | .000# | 0.701 | 0.501 | 0.955 | | | 0.363 |

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[illegible]

Exhibit D. Additional Paired Comparison Data

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| Variety #1= PH1CN | | TAS | | ECB | | ECB | | GLF | | NLF | | GOS | | HD | | GIB | | EYE | | COM | |
|-------------------|------|-------|-------|-------|-----|-----|-----|-------|-------|-----|-----|-----|-----|-------|-------|-----|-----|-----|-----|-----|-----|
| Variety #2= PHJ89 | | WT | | 1LF | | 2SC | | SPT | | BLT | | WLT | | SMT | | ERS | | SPT | | RST | |
| YEAR | # | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS | ABS |
| 95 | 1 | | | 7 | 3 | | | | | 8 | | | | | | | | | | | |
| | 2 | | | 4 | 4 | | | | | 8 | | | | | | | | | | | |
| | LOCS | | | 2 | 1 | | | | | 1 | | | | | | | | | | | |
| | REPS | | | 2 | 1 | | | | | 1 | | | | | | | | | | | |
| | PROB | | | 0.205 | | | | | | | | | | | | | | | | | |
| 96 | 1 | 3 | 6 | | | | | 2.3 | 6 | | | | | 100 | 8 | | | | | 7 | |
| | 2 | 3.9 | 6 | | | | | 2.8 | 5.3 | | | | | 100 | 7.5 | | | | | 6.5 | |
| | LOCS | 4 | 1 | | | | | 2 | 2 | | | | | 1 | 1 | | | | | 2 | |
| | REPS | 4 | 1 | | | | | 4 | 4 | | | | | 4 | 2 | | | | | 2 | |
| | PROB | .022+ | | | | | | 0.5 | 0.205 | | | | | | | | | | | 0.5 | |
| 97 | 1 | 4.4 | | | | | | 1.3 | 6.5 | | | 8 | | 91.8 | 7.5 | | | 5.5 | | | |
| | 2 | 4.4 | | | | | | 3 | 6 | | | 6 | | 100 | 7 | | | 7 | | | |
| | LOCS | 2 | | | | | | 2 | 2 | | | 1 | | 2 | 1 | | | 1 | | | |
| | REPS | 2 | | | | | | 4 | 4 | | | 2 | | 5 | 2 | | | 2 | | | |
| | PROB | 0.215 | | | | | | .090* | .000# | | | | | 0.385 | | | | | | | |
| TOTAL SUM | 1 | 3.4 | 6.7 | 3 | 3 | | | 1.8 | 6.6 | | | 8 | | 94.6 | 7.8 | | | 5.5 | | 7 | |
| | 2 | 4.1 | 4.7 | 4 | 4 | | | 2.9 | 6.1 | | | 6 | | 100 | 7.3 | | | 7 | | 6.5 | |
| | LOCS | 6 | 3 | 1 | 1 | | | 4 | 5 | | | 1 | | 3 | 2 | | | 1 | | 2 | |
| | REPS | 6 | 3 | 1 | 1 | | | 8 | 9 | | | 2 | | 9 | 4 | | | 2 | | 2 | |
| | DIFF | 0.6 | 2 | 1 | 1 | | | 1.1 | 0.5 | | | 2 | | 5.4 | 0.5 | | | 1.5 | | 0.5 | |
| T-TEST | PROB | .037+ | 0.225 | | | | | .078* | .034+ | | | | | 0.328 | .000# | | | | | 0.5 | |

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DEFINITIONS

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In the description and examples, a number of terms are used herein. In order to provide a clear and consistent understanding of the specification and claims, including the scope to be given such terms, the following definitions are provided:

- ANT ROT** = **ANTHRACNOSE STALK ROT** (*Colletotrichum graminicola*).
A 1 to 9 visual rating indicating the resistance to Anthracnose Stalk Rot. A higher score indicates a higher resistance.
- BAR PLT** = **BARREN PLANTS**.
The percent of plants per plot that were not barren (lack ears).
- BRT STK** = **BRITTLE STALKS**.
This is a measure of the stalk breakage near the time of pollination, and is an indication of whether a hybrid or inbred would snap or break near the time of flowering under severe winds. Data are presented as percentage of plants that did not snap.
- BU ACR** = **YIELD (BUSHEL/ACRE)**.
Yield of the grain at harvest in bushels per acre adjusted to 15.5% moisture.
- CLD TST** = **COLD TEST**.
The percent of plants that germinate under cold test conditions.
- CLN** = **CORN LETHAL NECROSIS**.
Synergistic interaction of maize chlorotic mottle virus (MCMV) in combination with either maize dwarf mosaic virus (MDMV-A or MDMV-B) or wheat streak mosaic virus (WSMV). A 1 to 9 visual rating indicating the resistance to Corn Lethal Necrosis. A higher score indicates a higher resistance.
- COM RST** = **COMMON RUST** (*Puccinia sorghi*).
A 1 to 9 visual rating indicating the resistance to Common Rust. A higher score indicates a higher resistance.
- DIP ERS** = **DIPLODIA EAR MOLD SCORES** (*Diplodia maydis* and *Diplodia macrospora*).
A 1 to 9 visual rating indicating the resistance to Diplodia Ear Mold. A higher score indicates a higher resistance.
- DRP EAR** = **DROPPED EARS**.
A measure of the number of dropped ears per plot and represents the percentage of plants that did not drop ears prior to harvest.
- EAR HT** = **EAR HEIGHT**.
The ear height is a measure from the ground to the highest placed developed ear node attachment and is measured in cm.
- EAR MLD** = **GENERAL EAR MOLD**.
Visual rating (1-9 score) where a "1" is very susceptible and a "9" is very resistant. This is based on overall rating for ear mold of mature ears without determining the specific mold organism, and may not be predictive for a specific ear mold.
- EAR SZ** = **EAR SIZE**.
A 1 to 9 visual rating of ear size. The higher the rating the larger the ear size.
- ECB 1LF** = **EUROPEAN CORN BORER FIRST GENERATION LEAF FEEDING** (*Ostrinia nubilalis*).
A 1 to 9 visual rating indicating the resistance to preflowering leaf feeding by first generation European Corn Borer. A higher score indicates a higher resistance.

- ECB 2IT** = **EUROPEAN CORN BORER SECOND GENERATION INCHES OF TUNNELING** (*Ostrinia nubilalis*).
Average inches of tunneling per plant in the stalk.
- ECB 2SC** = **EUROPEAN CORN BORER SECOND GENERATION** (*Ostrinia nubilalis*).
A 1 to 9 visual rating indicating post flowering degree of stalk breakage and other evidence of feeding by European Corn Borer, Second Generation. A higher score indicates a higher resistance.
- ECB DPE** = **EUROPEAN CORN BORER DROPPED EARS** (*Ostrinia nubilalis*).
Dropped ears due to European Corn Borer. Percentage of plants that did not drop ears under second generation corn borer infestation.
- EST CNT** = **EARLY STAND COUNT.**
This is a measure of the stand establishment in the spring and represents the number of plants that emerge on per plot basis for the inbred or hybrid.
- EYE SPT** = **EYE SPOT** (*Kabatiella zeae* or *Aureobasidium zeae*).
A 1 to 9 visual rating indicating the resistance to Eye Spot. A higher score indicates a higher resistance.
- FUS ERS** = **FUSARIUM EAR ROT SCORE.** (*Fusarium moniliforme* or *Fusarium subglutinans*).
A 1 to 9 visual rating indicating the resistance to Fusarium ear rot. A higher score indicates a higher resistance.
- GDU** = **GROWING DEGREE UNITS.**
Using the Barger Heat Unit Theory, which assumes that maize growth occurs in the temperature range 50°F - 86°F and that temperatures outside this range slow down growth; the maximum daily heat unit accumulation is 36 and the minimum daily heat unit accumulation is 0. The seasonal accumulation of GDU is a major factor in determining maturity zones.
- GDU SHD** = **GDU TO SHED.**
The number of growing degree units (GDUs) or heat units required for an inbred line or hybrid to have approximately 50 percent of the plants shedding pollen and is measured from the time of planting. Growing degree units are calculated by the Barger Method, where the heat units for a 24-hour period are:
$$GDU = (\text{Max. Temp.} + \text{Min. temp.}) - 50/2$$

The highest maximum temperature used is 86° F. and the lowest minimum temperature used is 50°F. For each inbred or hybrid it takes a certain number of GDUs to reach various stages of plant development.
- GDU SLK** = **GDU TO SILK.**
The number of growing degree units required for an inbred line or hybrid to have approximately 50 percent of the plants with silk emergence from time of planting. Growing degree units are calculated by the Barger Method as given in GDU SHD definition.
- GIBERS** = **GIBBERELLA EAR ROT (PINK MOLD)** (*Gibberella zeae*).
A 1 to 9 visual rating indicating the resistance to Gibberella Ear Rot. A higher score indicates a higher resistance.
- GLF SPT** = **GRAY LEAF SPOT** (*Cercospora zeae-maydis*).
A 1 to 9 visual rating indicating the resistance to Gray Leaf Spot. A higher score indicates a higher resistance.
- GOS WLT** = **GOSS' WILT** (*Corynebacterium nebraskense*).
A 1 to 9 visual rating indicating the resistance to Goss' Wilt. A higher score indicates a higher resistance.

| | | |
|---------|---|---|
| GRN APP | = | GRAIN APPEARANCE. This is a 1 to 9 rating for the general appearance of the shelled grain as it is harvested based on such factors as the color of harvested grain, any mold on the grain, and any cracked grain. High scores indicate good grain quality. |
| GQU/HA | = | YIELD Grain quintals per hectare |
| HC BLT | = | HELMINTHOSPORIUM CARBONUM LEAF BLIGHT (<i>Helminthosporium carbonum</i>). A 1 to 9 visual rating indicating the resistance to Helminthosporium infection. A higher score indicates a higher resistance. |
| HD SMT | = | HEAD SMUT (<i>Sphacelotheca reiliana</i>). This score indicates the percentage of plants not infected. |
| KER KG | = | KERNELS PER KILOGRAM. The number of kernels per 1 kilogram of seed after discard is removed. |
| KSZ DCD | = | KERNEL SIZE DISCARD. The percent of discard seed; calculated as the sum of discarded tip kernels and extra large kernels. |
| MDM CPX | = | MAIZE DWARF MOSAIC COMPLEX (MDMV = Maize Dwarf Mosaic Virus and MCDV = Maize Chlorotic Dwarf Virus). A 1 to 9 visual rating indicating the resistance to Maize Dwarf Mosaic Complex. A higher score indicates a higher resistance. |
| MST | = | HARVEST MOISTURE. The moisture is the actual percentage moisture of the grain at harvest. |
| NLF BLT | = | NORTHERN LEAF BLIGHT (<i>Helminthosporium turcicum</i> or <i>Exserohilum turcicum</i>). A 1 to 9 visual rating indicating the resistance to Northern Leaf Blight. A higher score indicates a higher resistance. |
| PLT HT | = | PLANT HEIGHT. This is a measure of the height of the plant from the ground to the tip of the tassel in cm. |
| POL SC | = | POLLEN SCORE. A 1 to 9 visual rating indicating the amount of pollen shed. The higher the score the more pollen shed. |
| POL WT | = | POLLEN WEIGHT. This is calculated by dry weight of tassels collected as shedding commences minus dry weight from similar tassels harvested after shedding is complete. |
| PRM | = | PREDICTED RELATIVE MATURITY. This trait, predicted relative maturity, is based on the harvest moisture of the grain. The relative maturity rating is based on a known set of checks and utilizes standard linear regression analyses and is also referred to as the Comparative Relative Maturity Rating System that is similar to the Minnesota Relative Maturity Rating System. |
| PRM SHD | = | PREDICTED RELATIVE MATURITY GDU TO SHED. A relative measure of the growing degree units (GDU) required to reach 50% pollen shed. Relative values are predicted values from the linear regression of observed GDU's on relative maturity of commercial checks. |
| RT LDG | = | ROOT LODGING. Root lodging is the percentage of plants that do not root lodge; plants that lean from the vertical axis at an approximately 30° angle or greater would be counted as root lodged. |

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SCT GRN = SCATTER GRAIN.
A 1 to 9 visual rating indicating the amount of scatter grain (lack of pollination or kernel abortion) on the ear. The higher the score the less scatter grain.

SDG VGR = SEEDLING VIGOR.
This is the visual rating (1 to 9) of the amount of vegetative growth after emergence at the seedling stage (approximately five leaves). A higher score indicates better vigor.

SEL IND = SELECTION INDEX.
The selection index gives a single measure of the hybrid's worth based on information for up to five traits. A maize breeder may utilize his or her own set of traits for the selection index. One of the traits that is almost always included is yield. When selection index data is presented, the tables represent the mean value averaged across testing stations.

SLF BLT = SOUTHERN LEAF BLIGHT (*Helminthosporium maydis* or *Bipolaris maydis*).
A 1 to 9 visual rating indicating the resistance to Southern Leaf Blight. A higher score indicates a higher resistance.

SOU RST = SOUTHERN RUST (*Puccinia polysora*).
A 1 to 9 visual rating indicating the resistance to Southern Rust. A higher score indicates a higher resistance.

STAGRN = STAYGREEN.
Staygreen is the measure of plant health near the time of black layer formation (physiological maturity). A high score indicates better late-season plant health.

STK CNT = NUMBER OF PLANTS.
This is the final stand or number of plants per plot.

STK LDG. = STALK LODGING.
This is the percentage of plants that did not stalk lodge (stalk breakage) as measured by either natural lodging or pushing the stalks and determining the percentage of plants that break below the ear.

STW WLT = STEWART'S WILT (*Erwinia stewartii*).
A 1 to 9 visual rating indicating the resistance to Stewart's Wilt. A higher score indicates a higher resistance.

TAS SZ = TASSEL SIZE.
A 1 to 9 visual rating was used to indicate the relative size of the tassel. The higher the rating the larger the tassel.

TAS WT = TASSEL WEIGHT.
This is the average weight of a tassel (grams) just prior to pollen shed.

TEX EAR = EAR TEXTURE.
A 1 to 9 visual rating was used to indicate the relative hardness (smoothness of crown) of mature grain. A 1 would be very soft (extreme dent) while a 9 would be very hard (flinty or very smooth crown).

TILLER = TILLERS.
A count of the number of tillers per plot that could possibly shed pollen was taken. Data are given as a percentage of tillers: number of tillers per plot divided by number of plants per plot.

TST WT = TEST WEIGHT (UNADJUSTED).
The measure of the weight of the grain in pounds for a given volume (bushel).

YLD SC = YIELD SCORE.
A 1 to 9 visual rating was used to give a relative rating for yield based on plot ear piles. The higher the rating the greater visual yield appearance.

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U. S. C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

| | | |
|--|---|--|
| NAME OF APPLICANT(S) PIONEER HI-BRED INTERNATIONAL, INC. | 2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER | 3. VARIETY NAME PH1CN |
| ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) 7301 NW 62nd AVENUE P.O.BOX 85 JOHNSTON, IA 50131-0085 | 5. TELEPHONE (include area code) 515-270-4051 | 6. FAX (include area code) 515-253-212 |
| | 7. PVPO NUMBER 9800378 | |

Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. ☒ YES ☐ NO

Is the applicant (individual or company) a U.S. national or U.S. based company? ☒ YES ☐ NO

If no, give name of country

0. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is(are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

1. Additional explanation on ownership (if needed, use reverse for extra space):

ariety PH1CN is owned by Pioneer Hi-Bred International, Inc.

LEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

the original breeder/owner may be the individual or company who directed final breeding. See section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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